

olefins and styrenes using above mentioned catalyst includes polystyrene, poly(substitutedstyrenes), poly(vinylbenzoate esters) and the mixture of them, or a copolymer comprising them as a main component.

Poly(substitutedstyrenes) include poly(hydrocarbon substitutedstyrenes) such as poly(methylstyrene), poly(ethylstyrene), poly(isopropylstyrene), poly(tert-butylstyrene), poly(phenylstyrene), poly(vinylstyrene) etc; poly(hologen substitutedstyrenes) such as poly(chlorostyrene), poly(bromostyrene), poly(fluorostyrene) etc; poly(alkoxystyrenes) such as poly(methoxystyrene), poly(ethoxystyrene) etc. Preferable olefin-sterenic copolymers are polystyrene, poly(p-methylstyrene), poly(m-methylstyrene), poly(p-tert-butylstyrene), poly(p-chlorostyrene), poly(m-chlorostyrene), poly(p-fluorostyrene), a copolymer of styrene and p-tert-buthylstyrene, and a copolymer of styrene and divinylbenzene.

The invention is described in more detail with reference to the following Examples, which, however, are not intended to restrict the scope of the invention.

[Example 1]

(1) Preparation of component (C):

0.875 ml of 2 M triisobutylaluminium was added to a toluene solution of 455 mg (1.75 mmols) of triphenylmethanol at -78°C,

and stirred at room temperature for 24 hours. The concentration of the component (C) thus formed was 0.1 mols/liter.

Through  $^1\text{H}$ -NMR, the product was confirmed to have the component (C) formed therein.

(2) Preparation of copolymer:

180 ml of toluene, 200 ml of styrene, 1.0 ml of a toluene solution of 1.0 M triisobutylaluminium, 3.5 ml of a toluene solution of 1.43 M methylalminoxane, and 5 ml of the component (C) prepared in the step (1) were put into a 1.6-liter autoclave equipped with a catalyst feeder tube, in that order, and heated up to 50°C. Next, ethylene was introduced into the autoclave to have a pressure of 0.294 MPaG (3 kg/cm<sup>2</sup>G). Next, 10.0  $\mu\text{mol}$  of (t-butylamido)dimethyl(tetramethyl- $\eta^5$ -cyclopentadienyl)silane-titanium dichloride dissolved in 20 ml of toluene was put into the autoclave via the catalyst feeder tube. Ethylene was continuously introduced into the autoclave so as to have all the time the constant pressure of 3.0 kg/cm<sup>2</sup>G (0.294 MpaG), and polymerized for 15 minutes. Next, methanol was added to this to stop the copolymerization. A large amount of methanol was added to this, and the polymer formed was separated through filtration, and then dried at 60°C under reduced pressure for 4 hours. Thus obtained, the ethylene-styrene copolymer weighed 47.2 g. As measured through GPC-FT/IR, its weight-average molecular weight was

190,000 in terms of polystyrene, and its molecular weight distribution was 2.4. As measured through  $^1\text{H}$ -NMR, the styrene content of the copolymer was 39 mol%. As measured through  $^{13}\text{C}$ -NMR, the structure of random copolymer was identified.

[Comparative Example 1]

The same process as in Example 1 was repeated, except that the component (C) prepared in the step of Example 1 (1) was not added to the copolymerization system in the step of Example 1 (2). As a result, herein obtained was 30.9 g of ethylene-styrene copolymer. As measured through GPC-FT/IR, its weight-average molecular weight was 200,000 in terms of polystyrene, and its molecular weight distribution was 2.6. As measured through  $^1\text{H}$ -NMR, the styrene content of the copolymer was 37 mol%. As measured through  $^{13}\text{C}$ -NMR, the structure of random copolymer was identified.

[Example 2]

170 ml of toluene, 200 ml of styrene, 1.0 ml of a toluene solution of 1.0 M triisobutylaluminium, and 5.0 ml of a ethylbenzene solution of 0.1 M diisobutyl-aluminiumtriphenyl methoxide were put into a 1.6-liter autoclave equipped with a catalyst feeder tube, in that order, and heated up to 50°C. Next, ethylene was introduced into the autoclave to have a pressure of 0.294 MPaG (3 kg/cm<sup>2</sup>G). Next, a solution where 10.0  $\mu\text{mol}$  of octahydrofluorenyl-titanium trimethoxide and 10 mmol of methylaluminoxane dissolved in 25 ml of toluene was